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Traceability activities in the United States and the TRACE project

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Contents

- Introduction
- Traceability drivers in the US
- Traceability research at Iowa State University
  - Relation to TRACE project
- Outreach
- Future activities
- Conclusions

Introduction

- ISO 8402: Traceability is the ability to trace the history, application or location of an entity by means of recorded identifications
  - Internal traceability
  - Chain traceability
- This is the original definition; later definitions weaker and more complex.

Traceability drivers in USA

- Regulatory compliance
- Liability issues
- Financial considerations:
  - Brand image, brand value
  - Litigation
  - Repetitive audits
- Consumer trust
- Inventory management
- New legislation

Traceability drivers in USA

Regulatory compliance and liability issues

- Should be able to demonstrate the ability to meet all local, state and federal requirements
- Registration requirement under the Bioterrorism Act of 2002
- Bioterrorism Act mandates that all members of food chain shall be able to trace goods one step forward and one step backward, as well as know the shipper/transporter of goods

Traceability drivers in USA

Existing Legislation (Bioterrorism Act 2002)	HR 2749 (Passed)	S 510 (Passed Mark-up)
One-Up, One Down Traceback	All-Up, All down Traceback	All-Up, All down Traceback including importers and exporters
Little Enforcement	Major Enforcement	Major Enforcement follows H.R. 2749
Farms, Restaurants and Groceries exempt, ambiguous link to the farm	Farms, Restaurants and Groceries included, clear traceback document links to the farm	Some Farms, Restaurants are exempt, but HACCP for all facilities with clear traceback links to the farm
Any form of records	Only electronic records	Only electronic records
Voluntary Recall	Mandatory Recall	Mandatory Recall
Reasonable Record Access by FDA	Mandatory Immediate Access to Records	Mandatory Immediate Access to Records
No facility registration fees required	US-$ 500 facility registration fee required every year	Facility registration fee is required every year with two year records retention
Any type of lot code identifier	Unique traceback identifier for product coding with standardized recordkeeping	Testing Labs must report all food contamination to FDA with unique food code

Traceability drivers in USA

Financial Considerations – Multiple Audits

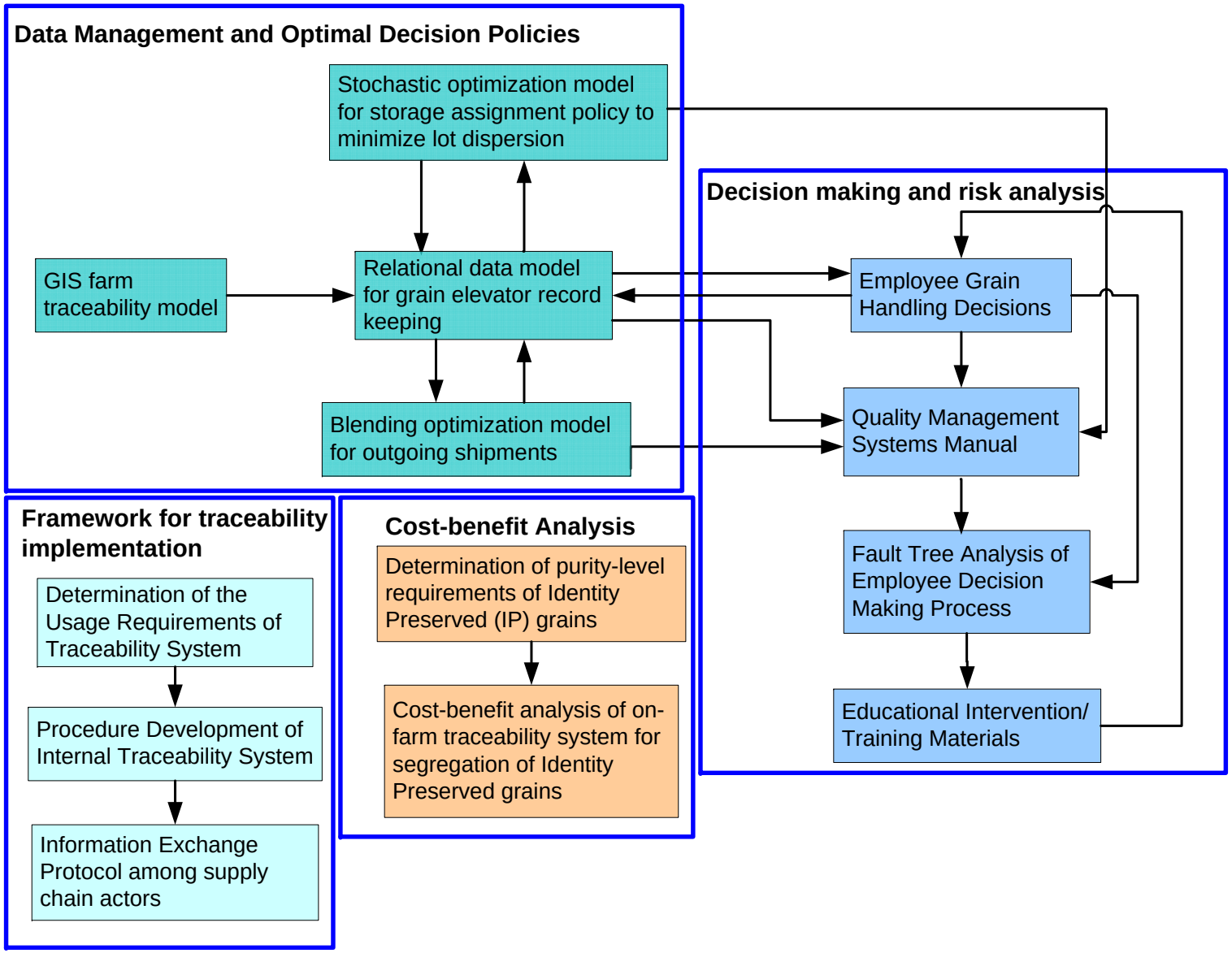
- AACC/ICC estimates $US 9 billion per year
- Proprietary schemes – 90-95% overlap but
- Different formats, order of items, auditor emphasis
- Food Processing industry gathering around GFSI (Global Food Safety Initiative) to certify harmonized audit schemes.

  http://www.mygfsi.com/

Traceability Research
Iowa State University

- **Guidelines:**
  - Framework for implementation of traceability in bulk grain supply chain
  - Sector-specific guidelines: Soybeans and Milk
- **Implementation:**
  - GIS based farm traceability model
  - Internal traceability database model for grain elevator
- **System analysis and optimization:**
  - Decision making and risk analysis
  - Cost benefit analysis of an on-farm traceability system
  - Optimization of internal and chain traceability

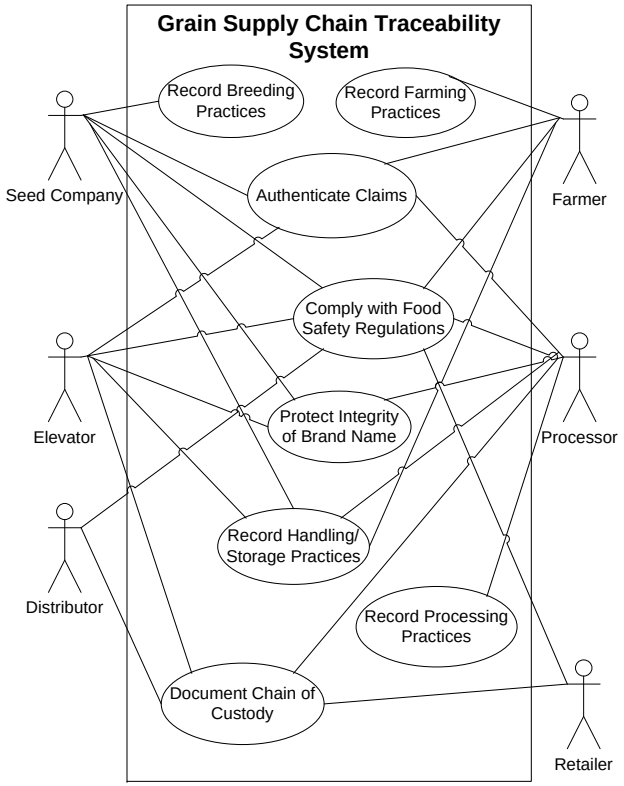
Traceability research at ISU

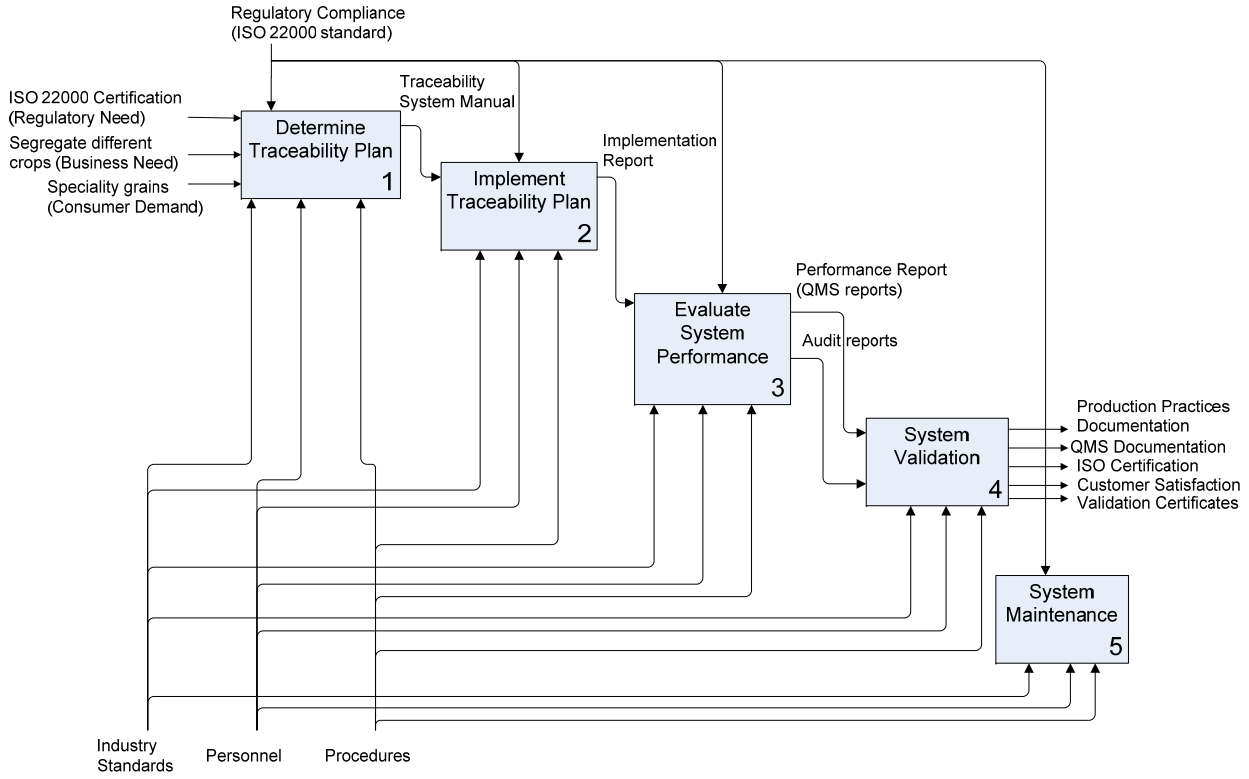


Framework for implementation of traceability

- Inspired by TraceFood framework to develop generic guidelines for implementation
- Systems approach
- First step: define usage requirements of the traceability system
- IDEF0 technique to define process inputs, outputs, controls and mechanisms
- Sequence diagram for information exchange between supply chain actors

Framework for implementation of traceability

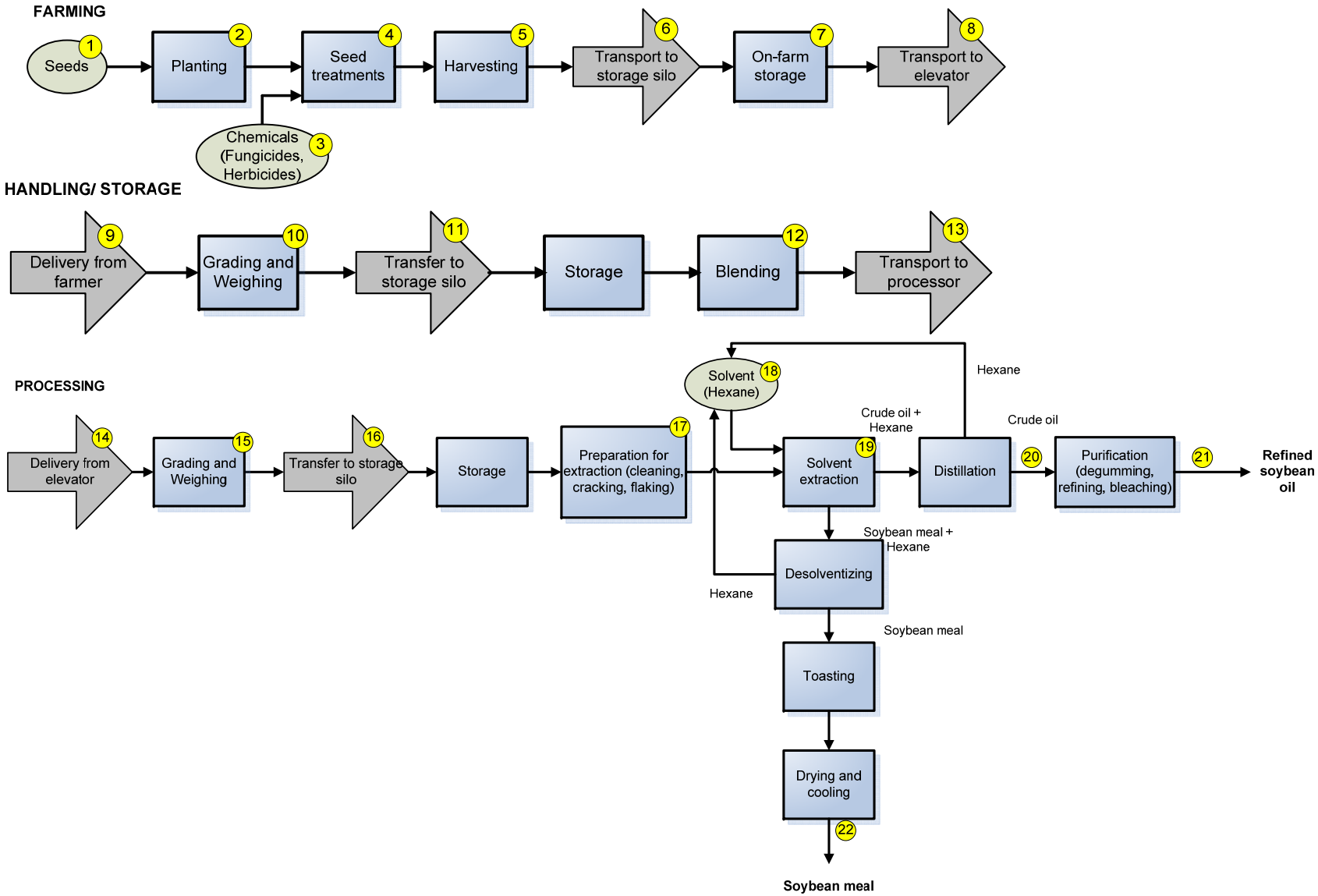




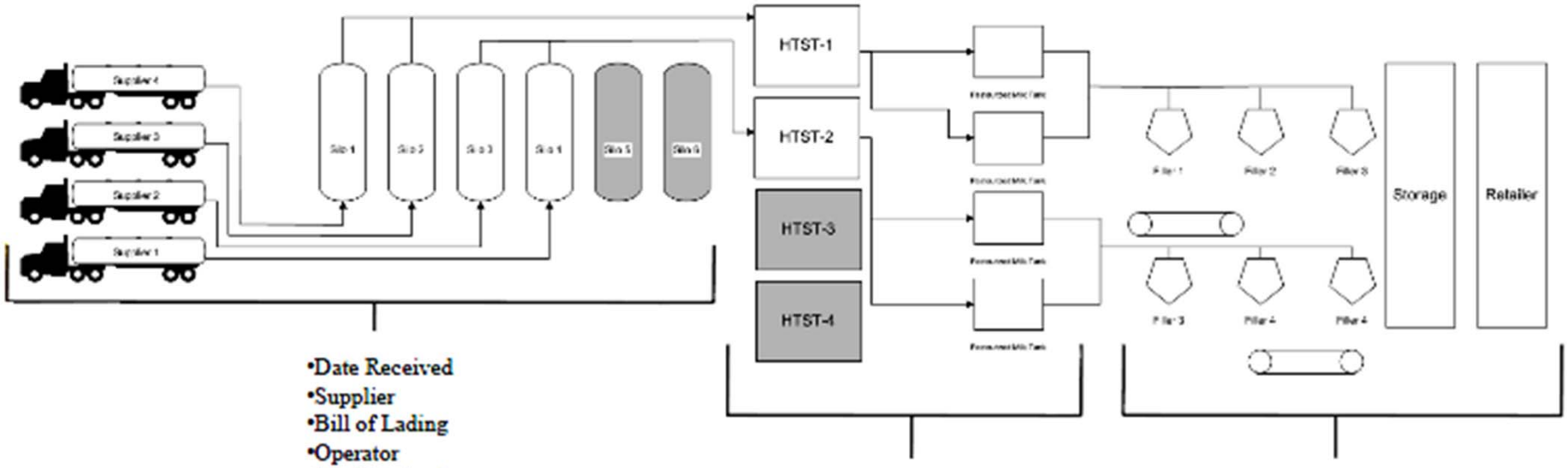
Sector-specific guidelines

- Inspired by TraceFood framework to develop sector-specific guidelines for implementation
- Soybean value chain
  - In collaboration with NOFIMA
  - Inspired by TraceFish project and study conducted in chicken sector
- Milk supply chain
  - Used Process Mapping technique

Sector-specific guidelines: Soybeans



Sector-specific guidelines: Milk



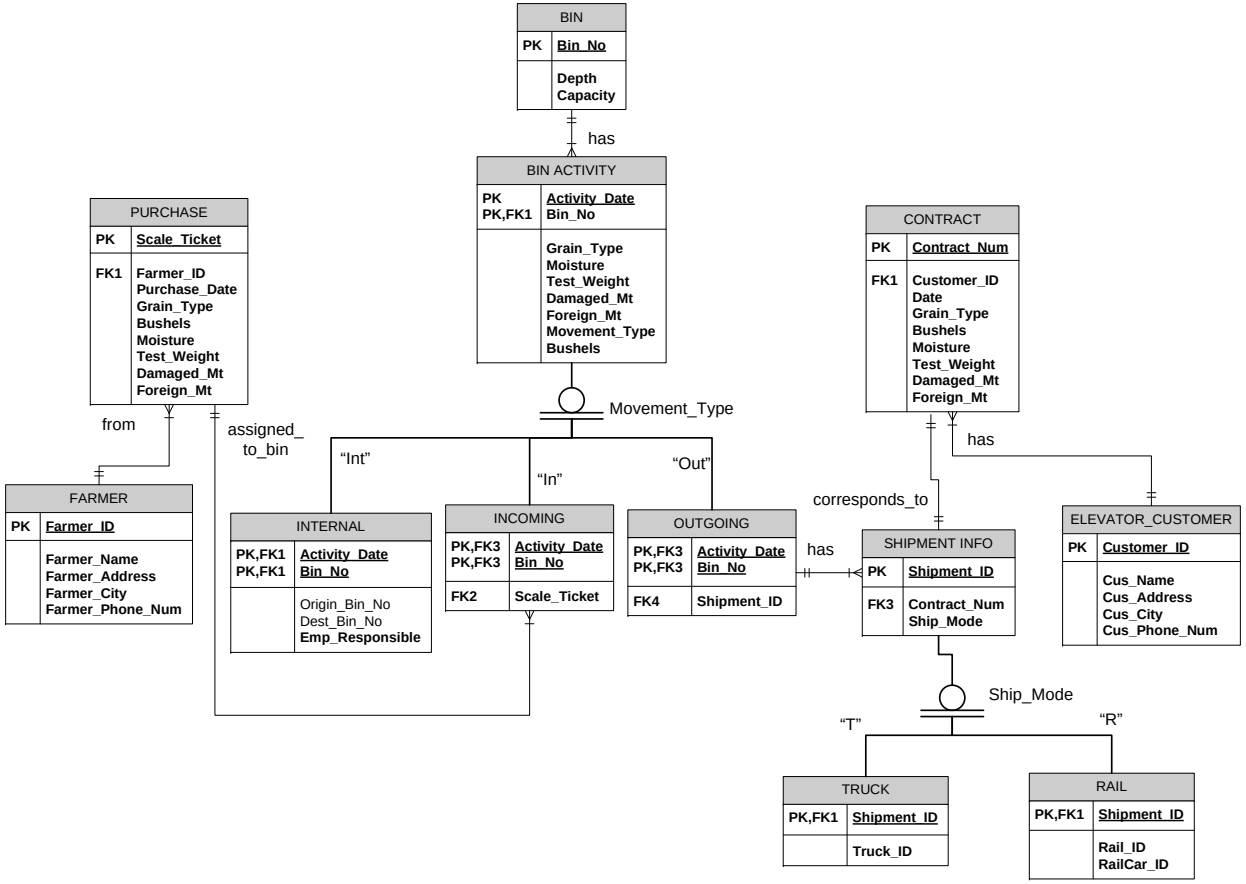
- Date Received
- Supplier
- Bill of Lading
- Operator
- Silo Destination
- Silo Level

- Silo Source
- Product
- Product Total
- Product Destination
- Cream Destination
- Cream Total

- Filler ID
- Product Description
- PT Tank Source
- Date Received
- UPC Number
- Sell By Date
- Cooler Location
- Pallet ID
- Quantity
- Product Destination
- Route ID
- Order Number

Implementation: ER modeling

- GIS based farm traceability model
- Internal traceability at a grain elevator

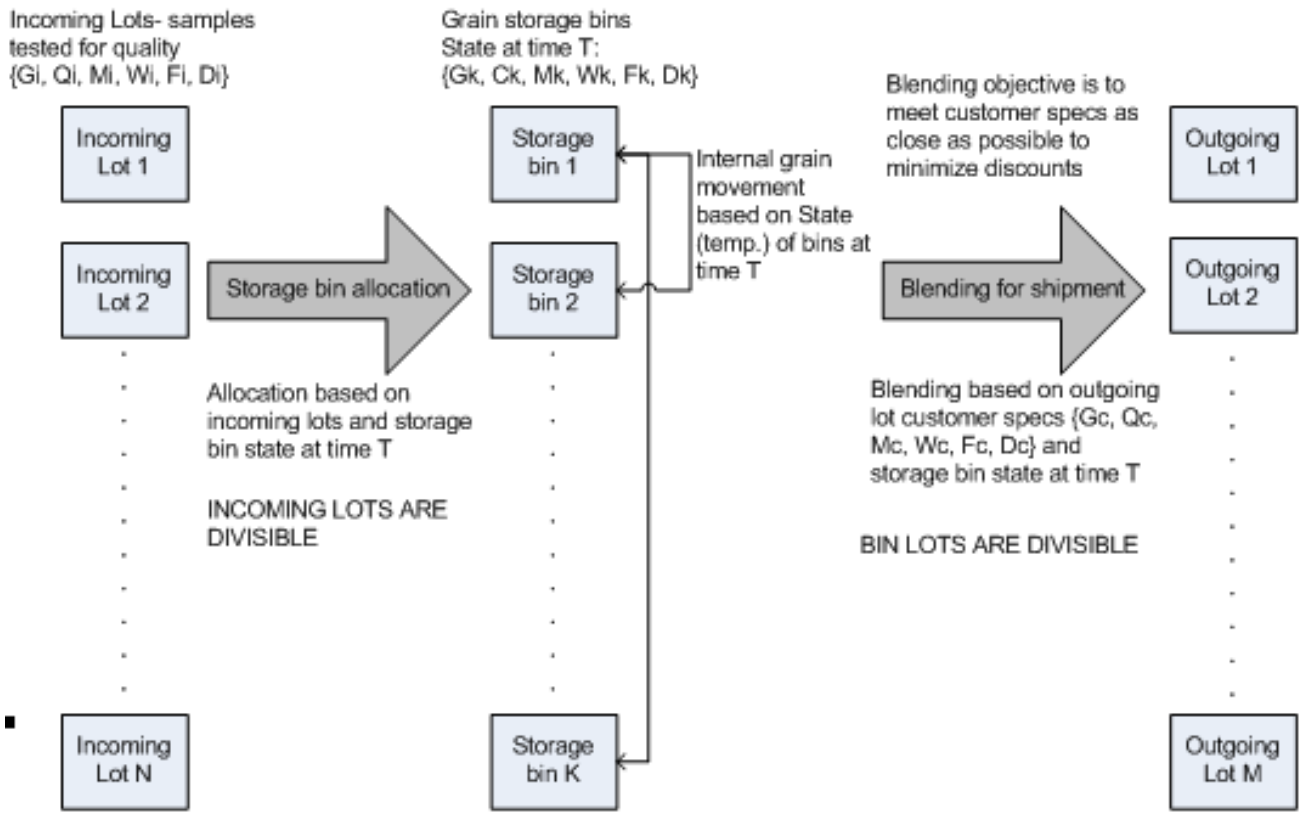


System Analysis and Optimization

- Analysis of employee decision making within a grain elevator
- The risk analysis examines selected operations that affect grain quality; from seed purchase to end user delivery, using fault tree analysis
- Cost-benefit analysis of an on-farm traceability system for Identity preserved grain

System Analysis and Optimization

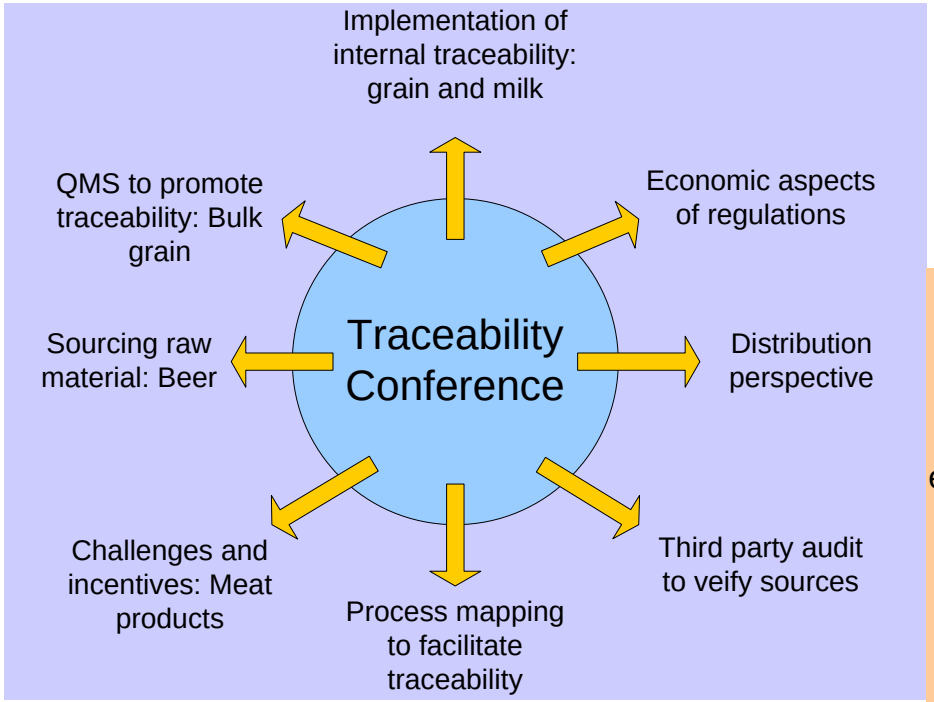
- Optimization models to minimizing mixing of bulk products

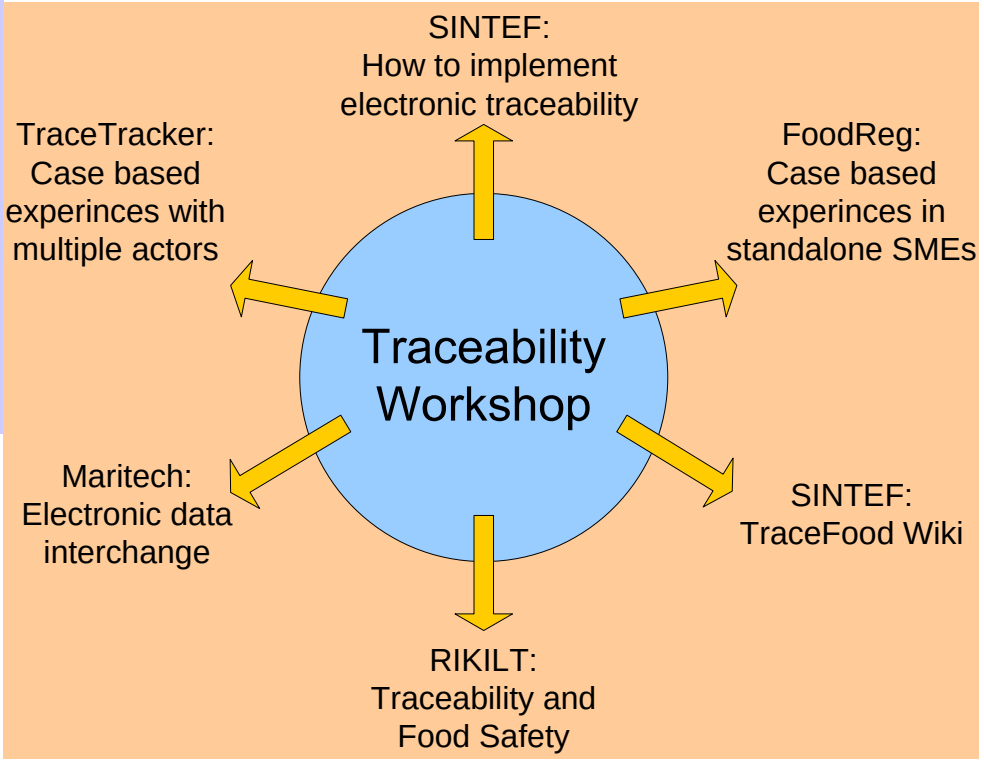


Outreach

- Agricultural and Food Traceability Conference held in June 2009 at Des Moines, Iowa
- Organized in conjunction with WP4 and WP5 researchers of TRACE project
- Concluding event for Food Chain Economic Analysis Project funded by USDA

Outreach


Implementation of internal traceability: grain and milk
QMS to promote traceability: Bulk grain
Economic aspects of regulations
Sourcing raw material: Beer
Traceability Conference
Distribution perspective
Challenges and incentives: Meat products
Process mapping to facilitate traceability
Third party audit to veify sources


SINTEF: How to implement electronic traceability
TraceTracker: Case based experinces with multiple actors
FoodReg: Case based experinces in standalone SMEs
Traceability Workshop
Maritech: Electronic data interchange
SINTEF: TraceFood Wiki
RIKILT: Traceability and Food Safety

Traceability Conference & Workshop

June 9 & 10, June 11, 2009

- Hosted approximately 60 people for 1 ½ day conference and 1 day workshop
- Attendees from business, scientific, and academic communities
- Speakers offered strategies, methods, regulatory initiatives, and economic implications of traceability
- Excellent initial discussion on traceability in U.S.
- Expanded potential for further research and collaboration between Iowa State University researchers and EU scientific community

Future activities

- Sector-specific guidelines for implementation of traceability in various food supply chains: Produce chains (ongoing)
- Optimization of internal and chain traceability efforts
- Data mining to identify food product recall patterns

Conclusions

- Traceability activities in US are mostly driven by regulatory compliance issues
- Iowa State University has been involved in traceability research since 2003
- Several research activities have been inspired by the TRACE project
- The outreach component was conducted in collaboration with TRACE researchers (WP4/5)
- The future activities include application of optimization, data mining techniques as well as developing sector-specific standards for various food products

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Thank you!

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